Human Factors Integration Capability Maturity Model (HFICMM)

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DCIEM, Toronto, Canada

UK National Leader

TTCP HUM TP9

Centre for Human Sciences

Defence Evaluation & Research Agency

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What is Capability Maturity?

A structured way of determining the extent to which an organization has processes………..
That are defined, managed, measured, controlled and effective.

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HFI CMM: The Goal is Assurance

- Of delivery of the human contribution to military capability

- That a project can produce a system that meets the User Requirement

- That an enterprise will produce a system that meets the system requirement, and which is operable BEFORE resources are committed.

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HFI CMM Programme

■ Year 1

   – Initial scoping study; examination of feasibility; potential benefits; development of study plan.

■ Year 2 (current year)

   – Collation of 'best practice'; development of 'process model'; trial assessment in early stages of procurement.

■ Year 3

   – Assessment in later stages of procurement; development of 'assessment model'; determination of skills required of assessors; validation.

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Approaches to HF Process Assessment

- GAO Guidelines FPCD-82-5, 1981
- Flanagan's IBM Usability Management Maturity (1995), Philips' Humanware (1996)
- ASCC 61/116K HE Audit
- ISO 1 18529 Human-centred lifecyle process descriptions, (links to ISO 13407, ISO 15288, ISO 15504)
- FAA iCMM
- **DND analysis of CMM for HF**
- **(ONR Human Engineering/System Engineering Integration)**
- **USAF HSI CMA**
- **UK MoD HFI CMM**

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Common Themes

▌ Assess whether user being considered in system acquisition

▌ Have a recognised external framework of best practice

▌ Have clear assessment scales

▌ Have a plan of action to address findings

▌ Integrate with Software or System Engineering

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Common Development Issues to Date

- Inclusion of generic management practices
- Boundaries of HF/HFI/HE/HSI within:

  - System Engineering

  - Employment of manpower and organisational development

  - System Operation

- Scope of management, technical, support practices
- Process vs Culture
- Process vs Expertise, Training
- Choice of standards for framework
- Links to specific life cycles

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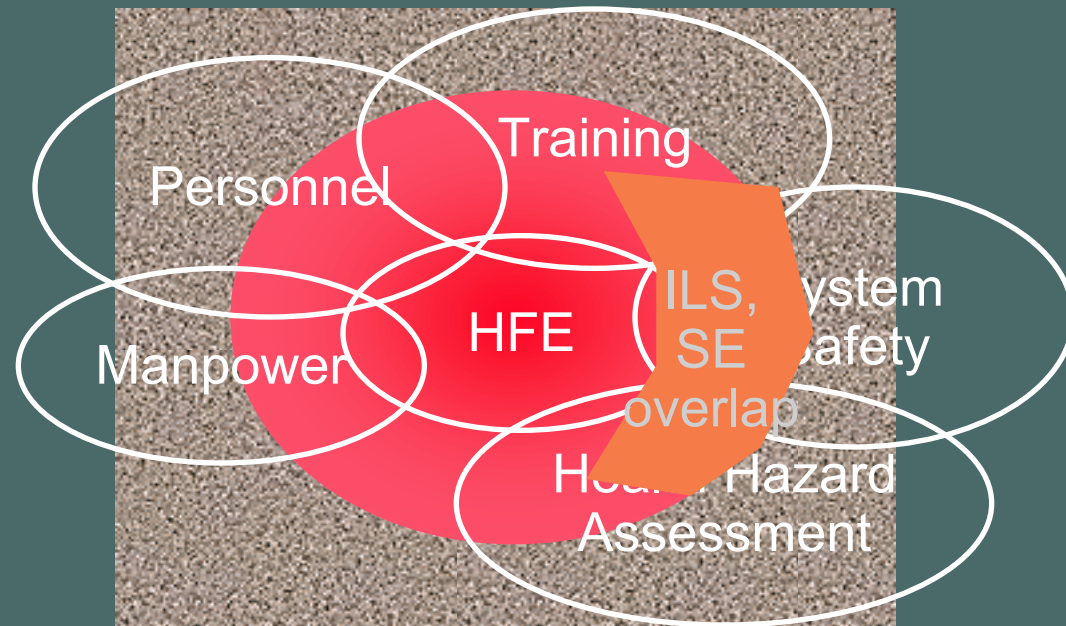# Scope and boundary issues
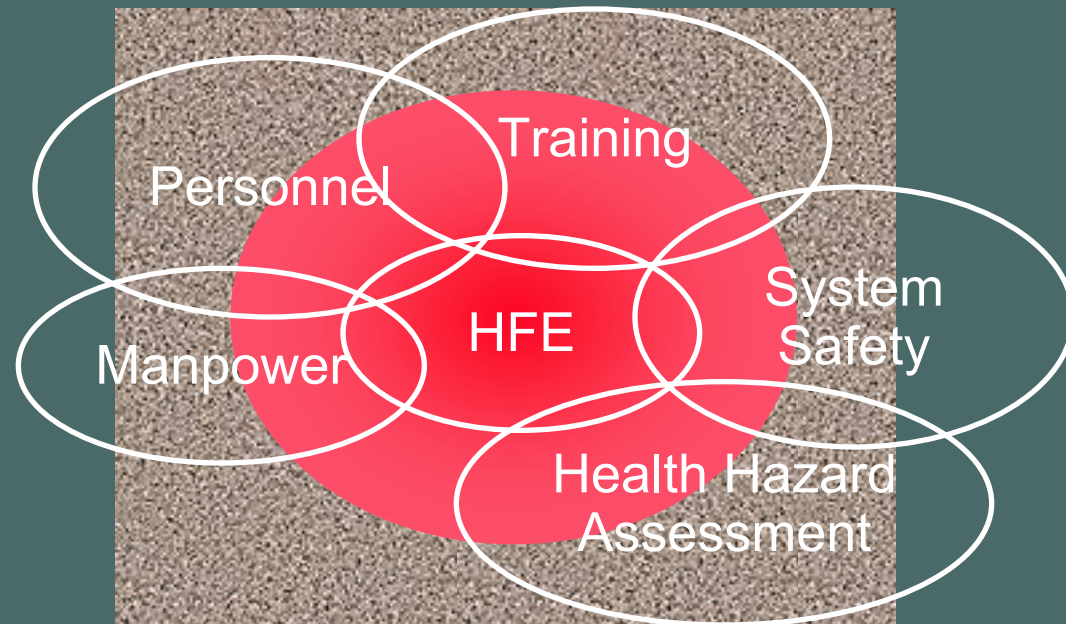
Scope of HFI within acquisition

Scope of manned (total) operational system

Scope and Boundary Issues

Scope of HFI within acquisition

Scope of manned (total) operational system

Personnel

Training

Manpower

HFE

ILS, SE overlap

System Safety

Health Hazard Assessment

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Uncertainties Facing Models - Continuing Development Issues

- Standards Quagmire, both for System Engineering and for Capability Assessment

- Ease of use: brevity with bite. Assessment: bang per buck, Improvement: succinctness of feedback

- Relationships between assessment models and guidance documents

- Getting uptake by customers and buy-in from industry

- Define 'good practice' or what people do now?

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Features of HFICMM in Relation to US/CAN Activity

- ISO basis for process model and capability assessment
- High level Reference Model and detailed Assessment Model
- Assessment methods include ISO standards
- MoD tailoring includes

  - Guidance on MoD application, links to Acquisition Handbook

  - Mapping to guidance and standards for HFI, ILS, Safety

- HFI boundaries and links between acquisition, MPT and operation considered
- Addresses management, technical, support and life-cycle issues

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Overview of Reference Model
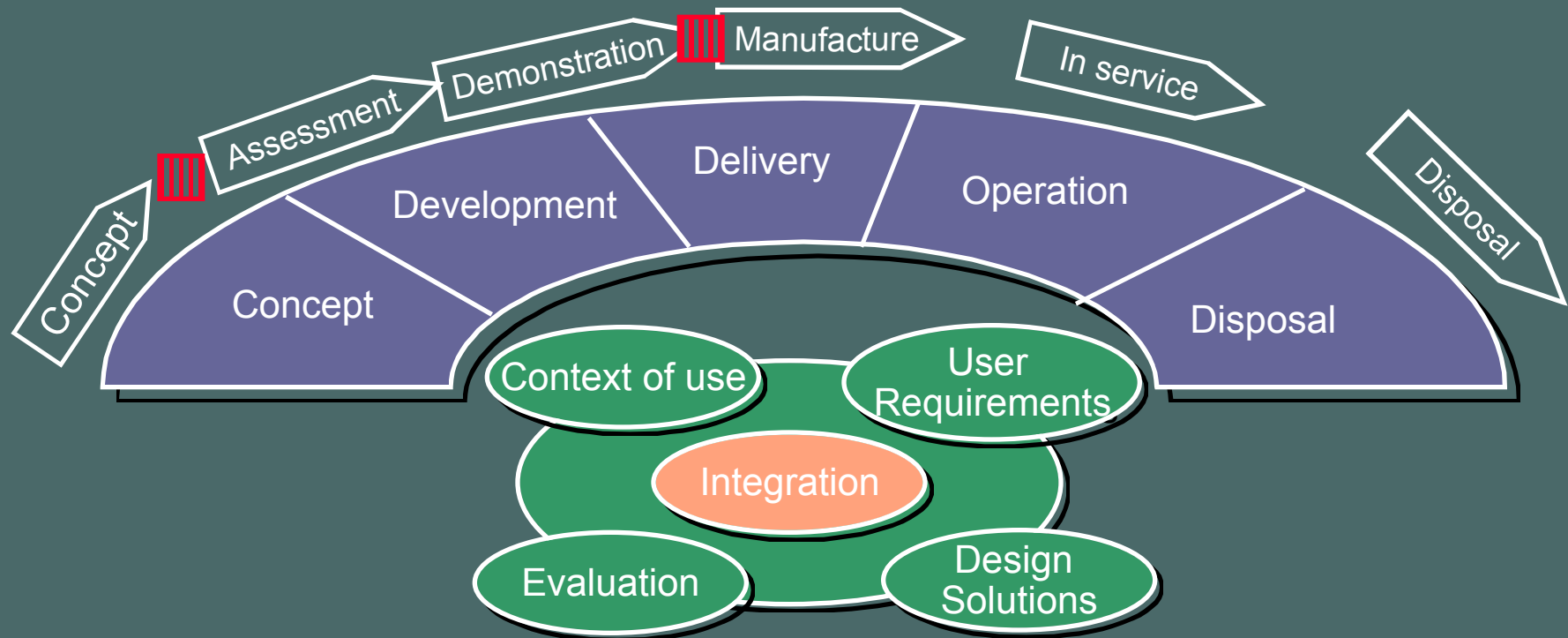
Features of ISO Basis for Process Model

- Supports International procurement, multi-national operation, COTS procurement
- Growing HF specialist base and application experience
- Interfaces to ISO 15288, ISO 15407/18529
- Standards contacts have allowed some anticipation of developments
- Powerful concepts of 'Context of Use', 'Quality in Use'
- Extensive review of ISO 13407 has provided analytical clarity
- An assessment model, but Reference Model sufficiently succinct to support guidance

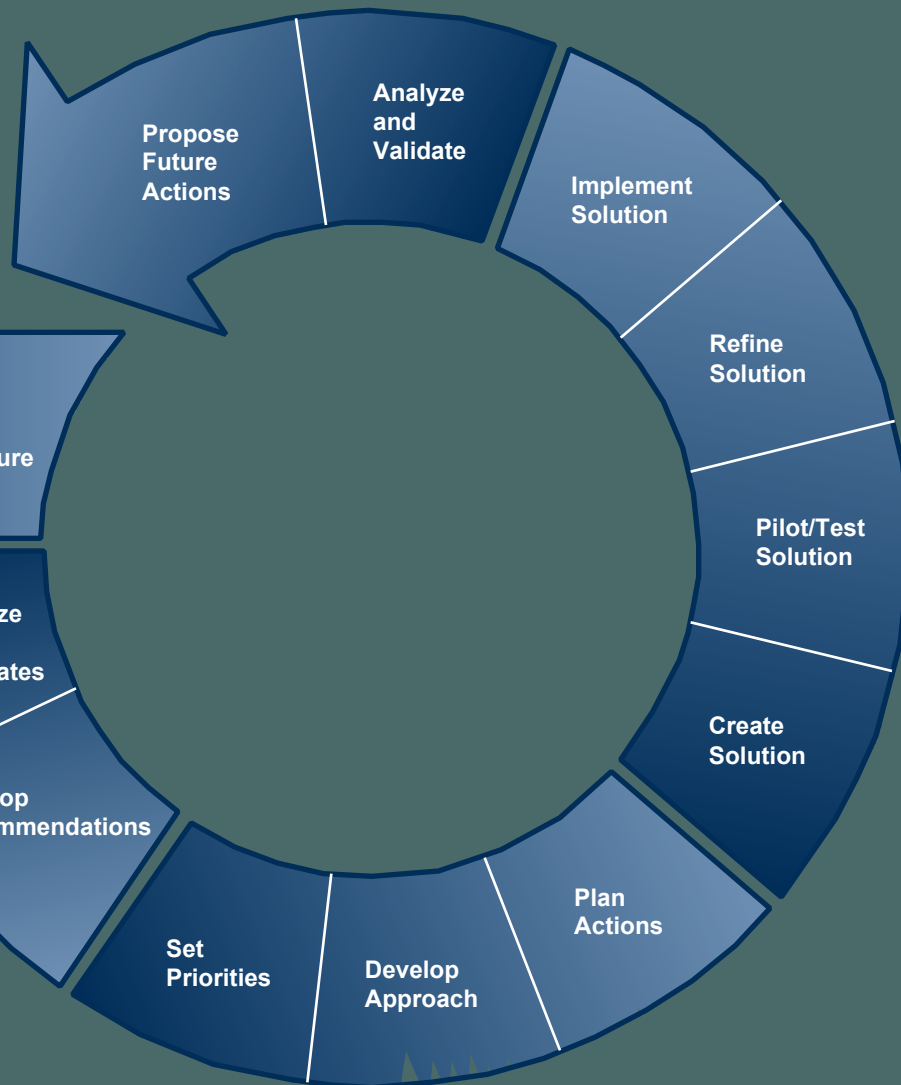DERA

Features of ISO Basis for Assessment Model

- Anticipates CMM/SPICE convergence
- Still retains CMM mapping
- KPAs can be emulated using profile
- UK/US differences in Software CE: project risk vs Level III or bust
- Compatible with ISO 9000/2000 and Quality-driven PI

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Options for Way Ahead - Timing

▊ 1   Information exchange and keep models separate

▊ 2   Converge on common models now

▊ 3   Converge on common models as SE and CE model base clarifies

  – 3.1   proactive

  – 3.2   reactive

▊ 4   Try for some multi-national project as trials environment?

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PI at the Meta-Level?

Customer Benefits of HFI CMM

- MOD Capability Management: assurance of an operable system, reduced onus on requirements

- DPA: reduced risk in contractor selection, possibly reduced procurement costs

- IPT: PI provides constructive framework for shared responsibilities

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